

## NEW HYBRIDS FROM THE ARNOLD ARBORETUM

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× **Akebia pentaphylla** (Mak.) Makino in Tokyo Bot. Mag. **16**: 30 (1902) = *A. quinata* Dcne. × *trifoliata* (Thbg.) Koidz.

*Akebia trifoliata* var. *pentaphylla* Makino in Tokyo Bot. Mag. **5**: 329 (1891).

Artificial hybrids between *Akebia trifoliata* Koidz. and *A. quinata* Dcne. were produced at the Arnold Arboretum in 1932 by Dr. Karl Sax.<sup>1</sup>

Though they have not yet flowered the hybrid seedlings have now reached a stage where their intermediate character is clearly evident and is in close agreement with Makino's description (l. c.) of × *A. pentaphylla*, a putative hybrid widely distributed in Japan. The hybrids, on the whole, resemble *A. trifoliata* somewhat more closely than they do *A. quinata*. As yet many of the leaves are three-foliolate, although leaves with four and five leaflets have been produced. It is of interest that Makino originally considered × *A. pentaphylla* as a variety of *A. trifoliata* (l. c.). In this connection one might speculate as to the origin of *A. trifoliata* Koidz. var. *australis* (Diels) Rehd. Diels<sup>2</sup> in describing the variety commented on its extreme variability, and it occurs in a region where both *A. trifoliata* and *A. quinata* are native. Furthermore, it is intermediate between the two species in both leaf and flower, though resembling *A. trifoliata* more closely. It seems not impossible that it has resulted through extensive hybridization between *A. trifoliata* and *A. quinata* in a region where the former is relatively more abundant.

It should be remembered that the consequences of hybridization between two species may be quite different in different parts of their ranges, depending upon the relative frequency of the two species, the presence of polyploid races within either parent, the adaptability of the hybrid to local conditions, etc. Such matters are usually highly speculative. The production of an artificial hybrid will make it possible, ultimately, to study such questions experimentally in the genus *Akebia*.

E. A.

**Prunus Juddii** E. Anderson, hybr. nov. = *P. Sargentii* Rehd. ♀ × *yedoensis* Mats. ♂.

<sup>1</sup>Arnold Arb. Bull. ser. iv. **2**: 17-20 (1934). — They are growing in the Arboretum under no. 624-32 and specimens collected June 3, 1935 are preserved in the herbarium.

<sup>2</sup>Bot. Jahrb. **29**: 344 (1900).

Intermedia inter parentes, et ab utroque differt praecipue inflorescentiis 2–6-floris breviter racemosis et breviter pedunculatis, calycis lobis sparse et leviter glanduloso-serratis, stylo basi sparse piloso.

Growing in the Arnold Arboretum under no. 22489 and type specimens collected May 5 and 10 and June 3, 1935, are preserved in the herbarium.

An upright tree with spreading branches. Branchlets glabrous. Leaves ovate, acuminate, doubly serrate, dull brownish green when unfolding, glabrous throughout. Flowers before the leaves in very short-peduncled racemes of two to six, subtended by greenish bracts. Pedicels with weak scattered hairs at the base. Petals oblong, white or whitish, flushed with deep rose pink (Ridgway). Calyx-tube cylindrical to sub-urceolate, glabrous. Calyx-lobes weakly and irregularly glandular-serrate. Style with scattered hairs at the base. Fruit black.

Among the seedlings of *Prunus Sargentii* Rehd. (*Prunus serrulata* Lindl. var. *sachalinensis* [F. Schmidt] Mak.) which have been raised from the original trees at the Arnold Arboretum were certain plants which are evidently hybrids between that species and other cherries which were flowering at about the same time. In the case of one of these specimens the evidence for its exact parentage is so clear and the hybrid tree promises to be of such horticultural importance for New England that it seemed desirable to provide the hybrid with a scientific name.

I take pleasure in naming the hybrid after the propagator for the Arnold Arboretum, Mr. W. H. Judd, whose precise record of the material which has passed through his department is of great scientific importance.

The hybrid originated in 1914 at the Arnold Arboretum as a seedling of one of the original trees of *Prunus Sargentii* raised from seed sent from Japan by Dr. W. S. Bigelow in 1890. *Prunus yedoensis* was acquired in 1902 and for many years a large specimen stood adjacent to *Prunus Sargentii*, no. 5777. Since their flowering dates usually overlapped it is not at all surprising that cross-fertilization should have taken place. Mr. Edwin L. Hillier of the West Hill Nurseries, Winchester, England, writes me that he has obtained similar hybrids from seed sent him from the Arnold Arboretum. Since seed of both *Prunus yedoensis* and *P. Sargentii* have been distributed very widely for a number of years by the Arnold Arboretum, it is quite possible that the hybrid may have turned up in a number of nurseries and gardens.

× *Prunus Juddii* has proved hardy during the last two phenomenally cold winters though it is planted at the edge of one of the coldest spots in the Arnold Arboretum. It furthermore holds its flowers longer than does *P. Sargentii* and is a thrifty quick-growing tree. From *P. Sargentii*

it can most easily be distinguished by the greener young leaves, by the scattered hairs at the bases of the style and the pedicel, and by the glandular serrations of the calyx. From *P. yedoensis* it can be distinguished by its brighter flowers and by its glabrous calyces and leaves. A more complete comparison of the hybrid and the parental species is given in Table I.

TABLE I. COMPARISON OF  $\times$  PRUNUS JUDDII WITH ITS PARENTS

<i>P. yedoensis</i>	$\times$ <i>P. Juddii</i>	<i>P. Sargentii</i>
branches spreading to horizontal	branches spreading	branches upright
leaves greenish when unfolding	leaves dull brownish green when unfolding	leaves bright bronze green when unfolding
flowers in 2-6-flowered short-peduncled racemes	flowers in 2-4-flowered very short peduncled racemes	flowers in sessile or sub-sessile clusters
pedicels finely pubescent	pedicels with weak scattered hairs at the base	pedicels glabrous
petals broadly oblong, nearly white	petals oblong, flushed with rose pink	petals narrowly oblong, typically bright rose pink
calyx tube urceolate-cylindric, finely pubescent	calyx tube sub-urceolate, glabrous	calyx tube cylindric-campanulate, glabrous
calyx-lobes strongly glandular-serrate	calyx-lobes weakly and irregularly glandular serrate	calyx-lobes entire
style pubescent	style with scattered hairs at the base	style glabrous

Since it has not been found wild, *Prunus yedoensis* has itself been thought to be a hybrid between *Prunus Lannesiana* and *Prunus subhirtella*.<sup>1</sup> The fact that it comes true from seed<sup>2</sup> makes this hypothesis less likely, though such true-breeding hybrids are not unknown in the genus *Prunus*.<sup>3</sup>

E. A.

$\times$  **Viburnum Juddii** Rehder, hybr. nov. = *V. Carlesii* Hemsl. ♀  $\times$  *bitchiuense* Mak. ♂.

A *Viburno Carlesii* praecipue differt foliis supra minus dense pilosis, petiolis paullo brevioribus, corymbo laxiore magis multifloro, corolla extus magis roseo suffusa graciliore, limbo paullo minore, lobis angustioribus filamentis quam antherae longioribus; A *V. bitchiuensi* differt praecipue foliis supra magis pilosis, petiolis paullo longioribus, 5-7 mm. longis, corymbo 6-7 cm. diam. magis florifero, corollis majoribus tubo

<sup>1</sup>Wilson, E. H. *The Cherries of Japan*, p. 19. Cambridge (1916).

<sup>2</sup>Russell, Paul. *The Oriental Flowering Cherries*, p. 19. Washington (1934).

<sup>3</sup>C. D. Darlington in *Jour. Genet.* 19: 213-256 (1928).

9–10 mm. longo, limbo 14–15 mm. diam., lobis paullo latioribus circiter 5 mm. latis, staminibus medio tubo affixis antheris faucem attingentibus.

Growing in the Arnold Arboretum under no. 447–20; type specimens collected May 14, 1929, May 9, 1930, May 14, 1931 and May 14, 1935.

This hybrid is in almost all characters intermediate between the parent species which are closely related and very similar, the chief difference being in the stamens which in *V. bitchiuense* are inserted in the lower fourth or third of the corolla-tube with the filaments about twice as long as the anthers and the tips of the latter 1.5–2 mm. below the mouth of the corolla-tube, while in *V. Carlesii* the stamens are inserted above the middle with the filaments as long or shorter than the anthers which reach the mouth of the corolla-tube. Table II shows the chief characters by which the hybrid may be distinguished from the parent.

TABLE II. COMPARISON OF VIBURNUM JUDDII WITH ITS PARENTS

	<i>V. bitchiuense</i>	× <i>V. Juddii</i>	<i>V. Carlesii</i>
Leaf	broad ovate to ovate or elliptic, sparingly furcate-pilose above, slightly lustrous above and usually rugose	ovate to ovate-oblong or elliptic, furcate-pilose above, bright green, not rugose	ovate to oblong-ovate, rather densely furcate-pilose and grayish green when young, not rugose
Petiole	2–7 mm. long	4–9 mm. long	5–12 mm. long
Inflor-escence	4–5 cm. across, rather loose, rays 7–12 mm. long, slender	6–8 cm. across, rather loose, rays about 1.5 cm. long, slender	4.5–6 cm. across, compact, rays 5–8 mm. long, stout
Corolla	pink outside, tube 7–8 mm. long, limb 12–14 mm. across, lobes 4–5 mm. broad	pink outside, tube 9–10 mm. long, limb 15–16 mm. across, lobes about 5 mm. broad	corolla faintly flushed pink outside, tube 7–8 mm. long, limb 15–16 mm. across, lobes 5–6 mm. broad
Filaments	inserted in the lower third of the corolla tube, about twice as long as anthers	inserted about or slightly below the middle, about 1–½ as long as anthers	inserted above to near the middle as long or slightly longer than anthers
Anthers	tips 1.5–2 mm. below the mouth	tips reaching the mouth	tips reaching the mouth

As shown by the table above, the hybrid holds the middle between the two parent species except in the size of the inflorescence and the length of the corolla-tube, in which it exceeds both parents. In its general appearance it resembles more *V. bitchiuense* on account of its looser habit and the looser inflorescence and more brightly pink flowers. As an ornamental plant it is superior to either parent.

*Viburnum Juddii* was raised in 1920 by Mr. William H. Judd of the Arnold Arboretum staff from seed of *V. Carlesii*. The largest plant of the hybrid is now 2 m. tall and flowered for the first time in 1929. Like the parent species it has stood the severe cold of the last two winters without injury to its flower-buds.

A. R.

× *Syringa diversifolia* Rehder, hybr. nov. = *Syringa pinnatifolia* Hemsl. ♀ × *oblata* Lindl. var. *Giraldii* (Lemoine) Rehd. ♂.

A *Syringa pinnatifolia* differt praecipue foliis partim integris, partim basi pinnatifidis pinnis 1–4 ovato-oblongis vel anguste ovatis 2–3 cm. longis acuminatis basi anguste decurrentibus leviter ciliolatis ceterum glabris, foliolo terminali ovato-oblongo sensim acuminato 3.5–5 cm. longo, foliis integris ovato-oblongis, 3.5–5 cm. longis, 1.4–2.2 cm. latis, basi rotundatis, inferioribus interdum fere ovatis, inflorescentia ad 12 cm. longa et laxiore, corolla coeruleo-lilacina, tubo circiter 8 mm. longo, limbo circ. 1 cm. diam., lobis apice leviter cucullatis, antheris faucem paene attingentibus; a *S. oblata* var. *Giraldii* recedit praecipue foliis partim pinnatifidis minoribus et angustioribus, gemma terminali ramorum evoluta et ramum foliiferum emittente, inflorescentia minore, corollae tubo brevioris et limbo angustioris, antheris faucem attingentibus.

Growing in the Arnold Arboretum under no. 148–30; type specimens collected May 17 and 21, 1935, preserved in the herbarium.

A comparison of the chief characters by which the hybrid differs from its parents are given in Table III.

TABLE III. COMPARISON OF SYRINGA DIVERSIFOLIA WITH ITS PARENTS

	<i>S. pinnatifolia</i>	<i>S. diversifolia</i>	<i>S. oblata</i> var. <i>Giraldii</i>
Leaf	pinnate with 7–11 leaflets, 3–6 cm. long, leaflets 4–10 mm. broad, finely ciliate when young	partly entire and partly pinnatifid with 3–5 leaflets 4–6 cm. long, lateral leaflets 5–14 mm. broad, entire leaves 2–2.5 cm. wide, glabrous	always entire broad ovate 4–10 cm. long, and 3–6 cm. broad, glabrous
Branches	with terminal bud	with or without terminal bud	without terminal bud
Panicles	4–7 cm. long, usually several pairs along the branches, sessile	to 11 cm. long, usually one pair at end of branches, sessile	to 15 cm. long, usually one pair at end of branches, peduncled
Corolla	white, usually tinged pale lilac, tube 5–6 mm. long, limb about 7 mm. across, lobes oval-ovate, not cucullate	whitish or bluish lilac, fading to whitish, tube about 8 mm. long, limb about 1 cm. across, lobes oval, slightly cucullate	lilac or purple lilac, tube 15–18 mm. long, limb about 1.5 cm. across, lobes oblong, strongly cucullate
Anthers	slightly exerted	anthers just reaching the mouth	anthers about 1.5 mm. below the mouth

This hybrid was raised in 1929 from seed collected in 1929 from *S. pinnatifolia* Hemsl. the flowers of which were apparently pollinated by a plant of *S. oblata* var. *Giraldii* (Lemoine) Rehd. not very far from *S. pinnatifolia*. In the same year, Dr. K. Sax fertilized *S. pinnatifolia*

with pollen of *S. oblata* var. *Giraldii* and plants were raised from this pollination; these plants have not yet flowered, but in their vegetative characters agree with the plant described above. The pollen of *S. pinnatifolia* is defective, at least that of our plant, and self-pollinated flowers produce no seeds. The hybrid is clearly intermediate between these two species, readily distinguished from both species by the partly pinnatifid and partly entire leaves. In the partly entire and partly pinnatifid leaves the hybrid resembles *S. persica* L. var. *laciniata*, which can be distinguished by the broadly decurrent often obtusish lobes of the leaves and by the narrower and generally smaller entire leaves, by the smaller panicles usually in several to many pairs along the branches, the absence of the terminal leaf-bud, and by the anthers not reaching the mouth.

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